

## REMARKS

Applicants appreciate the thorough and detailed examination of the present application as evidenced by the Office Action. Applicants further appreciate the non-finality of the Office Action in view of the new grounds of rejection. Claims 12, 13, 19-21, 26, 32-35, 45, 48 and 52 are pending in the application. Claims 12, 13, 20, 21, 32-35 and 52 have been allowed, and Claims 26, 45 and 48 stand rejected. Claims 26, 45 and 48 have been amended herein. Applicants submit that the claims as amended are patentable for at least the reasons discussed below, and Applicants respectfully request that the Examiner contact the undersigned directly in the event that the Examiner does not deem the application in condition for allowance.

### I. Specification

The Office Action states that the specification is objected to due to various informalities. *See* Office Action, page 2.

The poly(dimethylphenylvinylsilane-b-isoprene) structure in paragraph [0047] of the specification has been amended to clarify that the bond between the CH and the CH<sub>2</sub> in the isoprene repeating unit is a double bond.

In paragraph [0048] (at page 10, line 1), the structure is now identified by the correct chemical name, poly(pentamethyldisilylstyrene-co-hydroxystyrene).

In paragraph [0059] (at page 13, line 1), the structure is now identified by the correct chemical name, boron-containing hydroxylated polystyrene-b-isoprene. Applicants note that the hydroxylated isoprene unit is reacted with a carborane-1-carboxyl chloride to form the boron-containing repeating unit. *See* Specification, paragraph [0081].

In paragraph [0061] (at page 14, first line of text), the structure is now identified by the correct chemical name, boron-containing hydroxylated poly(styrene-b-isoprene).

In paragraph [0095] (at page 24, line 1), the structure is now identified by the correct chemical name, poly(pentamethyldisilylstyrene-co-hydroxystyrene). The structure has also been redrawn for clarification.

Therefore, Applicants submit that all of the alleged informalities have been addressed, and thus, Applicants respectfully request that the objections to the specification be withdrawn.

## **II. Claim 19**

The Office Action states that Claim 19 is objected to as including informalities. *See* Office Action, pages 2-3.

Claim 19 is herein amended to clarify that the bond between the CH and the CH<sub>2</sub> in the isoprene repeating unit is a double bond. In addition, the errant methyl group above formula c has been removed.

Accordingly, Applicants submit that the objection to Claim 19 has been addressed, and Applicants respectfully request that the objection to Claim 19 be withdrawn.

## **III. Claim 45 is Not Anticipated by Kotani**

The Office Action states that Claim 45 is rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 5,616,649 to Kotani et al. (hereinafter, "Kotani"). *Office Action*, page 3. The Office Action states that "Kotani teaches reacting a thermoplastic resin with a boron compound to form a boric acid esterified polymer..., and thus Kotani teaches the present limitation of performing [an] esterification reaction of a boron containing group with a polymer...". *Id.* (citations omitted).

Claim 45 as amended recites a method for forming a boron-containing resist polymer, comprising performing a hydroboration reaction using dimesitylborane as the hydroboration agent to introduce dimesitylborane into a polymer. Kotani neither teaches nor suggests performing a hydroboration reaction using dimesitylborane as the hydroboration agent to introduce dimesitylborane into a polymer. Therefore, Applicants submit that the rejection to Claim 45 is now overcome, and Applicants respectfully request that the rejection of Claim 45 under 35 U.S.C. § 102 be withdrawn.

## **IV. Claim 48 is Patentable Over Ritter**

The Office Action states that claim 48 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 4,638,092 to Ritter (hereinafter, "Ritter"). *See* Office Action, page 4. The Office Action states that Ritter teaches organo-boron compounds "containing radicals [that] are preferably directly connected (through hydroboration) to a carbon atom of the polymer matrix by at least one valence of the respective boron atom". *Id.*

Claim 48 as amended recites a method for forming a boron-containing resist polymer, comprising performing a hydroboration or esterification reaction of a boron-containing group with a polymer, wherein the polymer comprises a polymer selected from the group consisting of isoprene, styrene, vinyl compounds, poly(styrene-b-isoprene), hydroxylated poly(styrene-b-isoprene), poly(styrene-b-hydroxystyrene), and poly( $\alpha$ -methylstyrene-b-hydroxystyrene), to introduce dimesitylborane or a carborane into the polymer. Ritter neither teaches nor suggests performing a hydroboration or esterification reaction of a boron-containing group with a polymer to introduce dimesitylborane or a carborane into the polymer. Therefore, Applicants submit that the rejection to Claim 48 is now overcome, and Applicants respectfully request that the rejection of Claim 48 under 35 U.S.C. § 103 be withdrawn.

**V. Claims 26 and 48 are Patentable Over Chung**

The Office Action states that Claims 26 and 48 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,286,800 to Chung et al. (hereinafter, "Chung"). *See* Office Action, pages 4-5. The Office Action states that Chung teaches graft-polymerizing styrene monomer to poly(isobutylene-co-isoprene) containing boron groups. *Id.* The Office Action further states that "Chung also teaches that the level of incorporation of the boron monomer into the polyolefin may range preferably from 0.1 to 5 by mole." *See* Office Action, page 5 (citations omitted).

Claim 26 as currently amended recites a resist composition, comprising a boron-containing resist polymer, wherein the boron-containing resist polymer comprises less than about 1 weight percent boron, and further comprises an element selected from the group consisting of carborane, carborane carboxylic acid, dimesitylborane and combinations thereof. Chung neither teaches nor suggests a boron-containing resist polymer including a carborane, a carborane carboxylic acid or dimesitylborane. Applicants further submit that one of ordinary skill in the art would not be motivated to modify the description of Chung to arrive at the present invention as recited in amended Claim 26. Therefore, Applicants submit that Claim 26 is not obvious in view of Chung.

Claim 48 as currently amended recites a method for forming a boron-containing resist polymer, comprising performing a hydroboration or esterification reaction of a boron-containing group with a polymer, wherein the polymer comprises a polymer selected from the group

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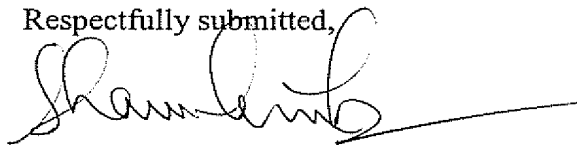
consisting of isoprene, styrene, vinyl compounds, poly(styrene-b-isoprene), hydroxylated poly(styrene-b-isoprene), poly(styrene-b-hydroxystyrene), and poly( $\alpha$ -methylstyrene-b-hydroxystyrene), to introduce dimesitylborane or a carborane into the polymer. Chung neither teaches nor suggests performing a hydroboration or esterification reaction of a boron-containing group with a polymer to introduce dimesitylborane or a carborane into the polymer. Applicants further submit that one of ordinary skill in the art would not be motivated to modify the description of Chung to arrive at the present invention as recited in amended Claim 48. Therefore, Applicants submit that Claim 48 is not obvious in view of Chung.

Thus, Applicants respectfully request that the rejection of Claims 26 and 48 under 35 U.S.C. § 103 be withdrawn.

#### Conclusion

At least in view of the foregoing, Applicants respectfully submit that pending application is in condition for allowance and request that a Notice of Allowance be issued in due course. The Examiner is invited and encouraged to contact the undersigned directly if such contact will expedite the prosecution of the pending claims to issue. In any event, any questions that the Examiner may have should be directed to the undersigned, who may be reached at (919) 854-1400.

Respectfully submitted,



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#### CERTIFICATION OF TRANSMISSION UNDER 37 CFR § 1.8

I hereby certify that this correspondence is being transmitted electronically to the U.S. Patent and Trademark Office on 8/24/06 using the EFS:

Signature: Sarah Abraham Date: August 24, 2006  
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